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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,801	12/28/2001	Jae Doeg Lim	SAMS01-00166	1745

7590 09/20/2005

Docket Clerk
P.O. Drawer 800889
Dallas, TX 75380

EXAMINER	
ABRAHAM, ESAW T	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/035,801	LIM ET AL.	
	Examiner	Art Unit	
	Esaw T. Abraham	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6,7,10,11,14,15,18,19,22,23* is/are rejected.

7)☒ Claim(s) *4,5,8,9,12,13,16,17,20,21,24 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to the applicant's amendments

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/29/05 has been entered.

Response to the applicant's argument

The applicant argues that the prior art of record (Yi) in claim 16 does not teach an interleaver with an input coupled to an output of first turbo encoder. Although, Yi does not explicitly teach the terms such as input / output from the interleaver coupled to the convolutional or turbo encoders, it is known and common practice in the art of forward error correction systems that turbo encoders or convolutional or RSC encoders commonly connected to an interleaver to arrange parts of one sequence of things or events so that they can alternate one or more other sequences. For example; turbocoder of the so-called PCCC (Parallel Concatenated Convolutional Code) type comprises a set of coders concatenated in parallel and separated by interleavers and the outputs of the different coders are multiplexed by a multiplexer, a turbocoder of the so-called SCCC (Serially Concatenated Convolutional Code) comprises a set of coders concatenated in series and the coders being separated by an interleaver. Further, the examiner would like point out that terms "first and second turbo encoders" in claims (1, 10, 18 and 22) are vague and must be clear in order to distinguish "the turbo encoders" from the other encoders. For example, (RSC) encoders could be called as "1st and 2nd encoders" or as "turbo encoders" or "convolutional encoders" etc... Therefore, the

examiner would like to suggest or advice the applicant to include the objected dependent claims (4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24 and 25) in the independent claims (1, 10, 18 and 22) to clarify that the claimed encoders (turbo encoders) are different from the RSC or convolutional encoders.

DETAILED ACTION

1. Claims **1-25** are remain pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims **1-3, 10-11 and 18-19** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yi (U.S. PN: 5,907,582).

As per claims **1, 10 and 18,** Yi teach or disclose a digital communication system comprising first turbo encoder for turbo encoding digital source information, an interleaver for interleaving the digital source information, second turbo encoder for turbo encoding the interleaved digital source information into a second code sequence (see claim 16, section A 1-3).

As per claims **2, 11 and 19,** Yi teach all the subject matter claimed in claim 1 including first and second punctures for selectively replacing data in the fist and second code sequences (see claim 16, section A 4 and 5).

As per claim **3,** Yi teach all the subject matter claimed in claims 1 and 2. Although, Yi is silent on how the apparatus is capable of providing a packet data error rate less than one percent when 64-QAM modulation is used, this practice is deemed to be inherent to the system of Yi as Yi's invention provide code diversity with packet combining to result in an overall improved performance through very high coding gain and since the Yi's system performance is improved through a very high coding, by virtue of the fact the system of Yi reduce a packet data error rate and improve the information bit rate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims **6-7, 14-15 and 22-23,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yi (U.S. PN: 5,907,582) in view of Park et al. (U.S. PN: 6,397,367).

As per claims **6, 14, and 22**,Yi teach or disclose a digital communication system comprising first turbo encoder for turbo encoding digital source information, an interleaver for interleaving the digital source information, second turbo encoder for turbo encoding the interleaved digital source information into a second code sequence (see claim 16, (1)-(3)). Yi further teaches a first and second multiplexers for multiplexing the source data information together with first punctured code sequence and second punctured code sequence (see claim 17). Yi **does not explicitly** teach that a multiplexer capable of multiplexing data from said first turbo encoder and from said second turbo encoder. **However,** Park et al. in figure 5 teach a first channel coder (first turbo encoder) (502) and a second channel coder (second turbo encoder) (512) output turbo encoded data and coupled to a multiplexer (503) whereby the multiplexed data is rate matched at a rate matcher (504) by symbol repetition, puncturing or puncturing-after-symbol repetition (see col. 2, lines 22-33). **Therefore,** it would have been obvious at the time the invention was made to one of ordinary skill in the art to include a multiplexer as taught by Park et al. for multiplexing data outputted from first and second turbo encoders. **This modification** would have been obvious because a person having ordinary skill in the art would have been motivated to do so because providing a multiplexer that are selecting data from the first and the second turbo encoders is a known in the art of transmitting communication systems (see col. 2, lines 22-24) for multiplexing data coming from different channels.

As per claims **7, 15 and 23,** Yi in view of Park et al. teach all the subject matter claimed in claims 6, 14 and 22 including Park et al. in figure 5 teach a first channel coder (first turbo encoder) (502) and a second channel coder (second turbo encoder) (512) output turbo encoded data and coupled to a multiplexer (503) whereby the multiplexed data is rate matched at a rate

matcher (504) by symbol repetition, puncturing or puncturing-after-symbol repetition (see col. 2, lines 22-33).

Allowable subject matter

4. Claims **4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24 and 25** are objected to as being dependent upon a rejected base claim but would be allowable if rewritten independent from including all of the limitation of the base claim and any intervening claims.

The first turbo encoder comprises a first convolutional encoder for encoding data, an interleaver for interleaving encoded data and a second convolutional encoder for encoding the interleaved data (as in claims 4, 8, 12, 16 20 and 24).

The second turbo encoder comprises a first convolutional encoder for encoding data, an interleaver for interleaving encoded data and a second convolutional encoder for encoding the interleaved data (as in claims 5, 9, 13, 17, 21 and 25).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 6,553,516 Suda et al.

US PN: 6,374,386 Kim et al.

6. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (571) 272-3812. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (571) 272-3819. The fax phone numbers for the organization where this application or proceeding is assigned (571) 273-8300.

Information regarding the status of an Application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or PUBLIC PAIR. Status information for unpublished applications is available through Private Pair only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Esaw Abraham

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Art unit: 2133

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